HP NetServer LC 2000
with
NetRAID-3Si (HP Rack Storage/12)
Cluster Configuration Guide

14 November 2000
(see Versions at the end of this document)

Introduction

This document defines the supported HP NetServer LC 2000 configuration with HP Rack Storage/12s and Microsoft Cluster Server. These configurations minimize single points of failure (SPOF), and provide extended availability. The specific configuration certified and supported by both Hewlett-Packard and Microsoft is defined, as are other guidelines to assist you in configuring your clustered NetServers. This guide is prescriptive; it describes the configurations supported by HP. Any deviance to these configurations can result in an inoperative cluster or an operating cluster with degraded performance, hidden SPOFs, etc., and therefore will not be supported by HP.

What's Defined in Cluster

Cluster

SPUs

Local and Shared Storage

Intra-cluster and Client LANs

Shared Storage Cabling

Cluster

Type of SPUs	HP NetServer LC 2000 Each node must be the same model SPU, but may have different sizes of main memory, cache, and different CPU clock speeds.
Installation	Pedestal or racked
Number of nodes	2
Shared Storage	HP Rack Storage /12 with HP NetRAID-3Si controller and HP disks. See *Shared Storage* below.
LANs:	
Client LAN	Any NIC that is HP and Microsoft approved. See *Client LAN* below.
Intra-cluster (Heartbeat) LAN	Embedded NIC with crossover cable. See *Intra-cluster LAN* below.
Power source	Direct from power mains, power conditioner or uninterruptible power

	supply (UPS) using any power conditioner or UPS. Redundant power distribution units (PDU's) are strongly recommended.
System software:	
Navigator version	L.18.00 or later
Operating System	Microsoft Windows NT Server 4.0, Enterprise Edition
Service pack	SP6A or later

SPU

Model	HP NetServer LC 2000
Clock speed	533, 600, 667, 733, 800, 933, 1000 MHz
No. of CPUs	2
BIOS version	4.06.20 PV or later (533, 600, 733 MHz) 4.06.23 PV or later (800, 933 MHz) 4.06.25 PV or later (1000 MHz)
CPU cache	Any size
RAM	128 MB minimum. Must be HP.
No. of power supplies	1 standard, 2 required for redundancy
Local storage	See *Local Storage* below.
I/O slots	Added cards may be installed in any appropriate slot, keeping in mind the server's default boot order as listed below:
Default Boot Order	IDE CD-ROM, FDD, SCSI A, SCSI B, PCI-1, PCI-2, PCI-3, PCI-4, PCI64-5, PCI64-6
M/S Certified Configuration	M/S Certified Configuration: P1 - Local storage (NetRAID-1Si) P3 - Client LAN (D5013B) P5 - Shared Storage (NetRAID-3Si) Booted from embedded SCSI in tests up to 1000 MHz. Booted from NetRAID-1Si in 1000 MHz certification

Storage

Local

Controller	May use embedded SCSI, NetRAID-1Si, or NetRAID-3Si.
Driver	For embedded SCSI, use sym_hi.sys version 4.12 or later For NetRAID-xSi, use mraidnt.sys version 2.24
Cabinets (Physical drive location)	SPU internal drive bays or HP external drive cabinet (e.g., HP Rack Storage/12), any number.
Disk drives	Must be HP (hot swap or fixed)
SCSI bus	Any HP cables that meet SCSI specifications and any SCSI bus speed.
SCSI Ids	Any

Shared

Controller	
Model	HP NetRAID-3Si Adapter D5955A
No. of controllers	1
Firmware	W.01.30
BIOS	B.02.02
Driver	Mraidnt.sys 2.24
NetRAID Assistant	A.01.15 or later

SCSI IDs	6, 7
Channels	0, 1, 2
RAID level	1, 5, 10, 50
Logical disks	1 per RAID array 8 maximum per NetRAID-3Si adapter
Configuration options:	Cluster mode on Cache write-policy to Write-thru Set any other options as desired

Cabinet

RAID arrays	A RAID array (logical disk) must be composed of all the same disk model (i.e., part number and suffix). Different size or speed disks are not allowed in the same RAID array. Any combination of disk models is allowed on a SCSI channel. Any combination of disk models is allowed in a cluster.
Number of cabinets	1 – 3
Cabinet type	Rack Storage/12
Model	D5989B plus two D6025B's for each Rack Storage/12
Status SCSI ID	5 (fixed)
Disk SCSI IDs	0 – 3, 8 – 15 (fixed)
Disk drives:	Any HP drive supported by storage enclosure including: HP 9.1 GB (7200 rpm) Low Profile Ultra2 SCSI Disk Module D6106A HP 9.1 GB (7200 rpm) Low Profile Ultra3 SCSI Disk Module P1217A HP 9.1 GB (10k rpm) Low Profile Ultra2 SCSI Disk Module D6107A HP 9.1 GB (10k rpm) Low Profile Ultra3 SCSI Disk Module P1168A HP 18.2 GB (7200 rpm) Half Height Ultra2 SCSI Disk Module D6108A HP 18.2 GB (7200 rpm) Low Profile Ultra3 SCSI Disk Module P1216A HP 18.2 GB (10k rpm) Half Height Ultra2 SCSI Disk Module D7031A HP 18.2 GB (10k rpm) Low Profile Ultra3 SCSI Disk Module P1166A HP 18.2 GB (7200 rpm) Low Profile Ultra2 SCSI Disk Module D7174A HP 18.2 GB (10k rpm) Low Profile Ultra2 SCSI Disk Module D7175A HP 36.4 GB (10k rpm) Half Height Ultra2 SCSI Disk Module D8210A HP 36.4 GB (10k rpm) Low Profile Ultra3 SCSI Disk Module D9419A
Cables	Any 2 HP LVD SCSI cables from the following list: 1 meter D7131A 2.5 meter D6020A 5 meter D6982A 10 meter D6983A

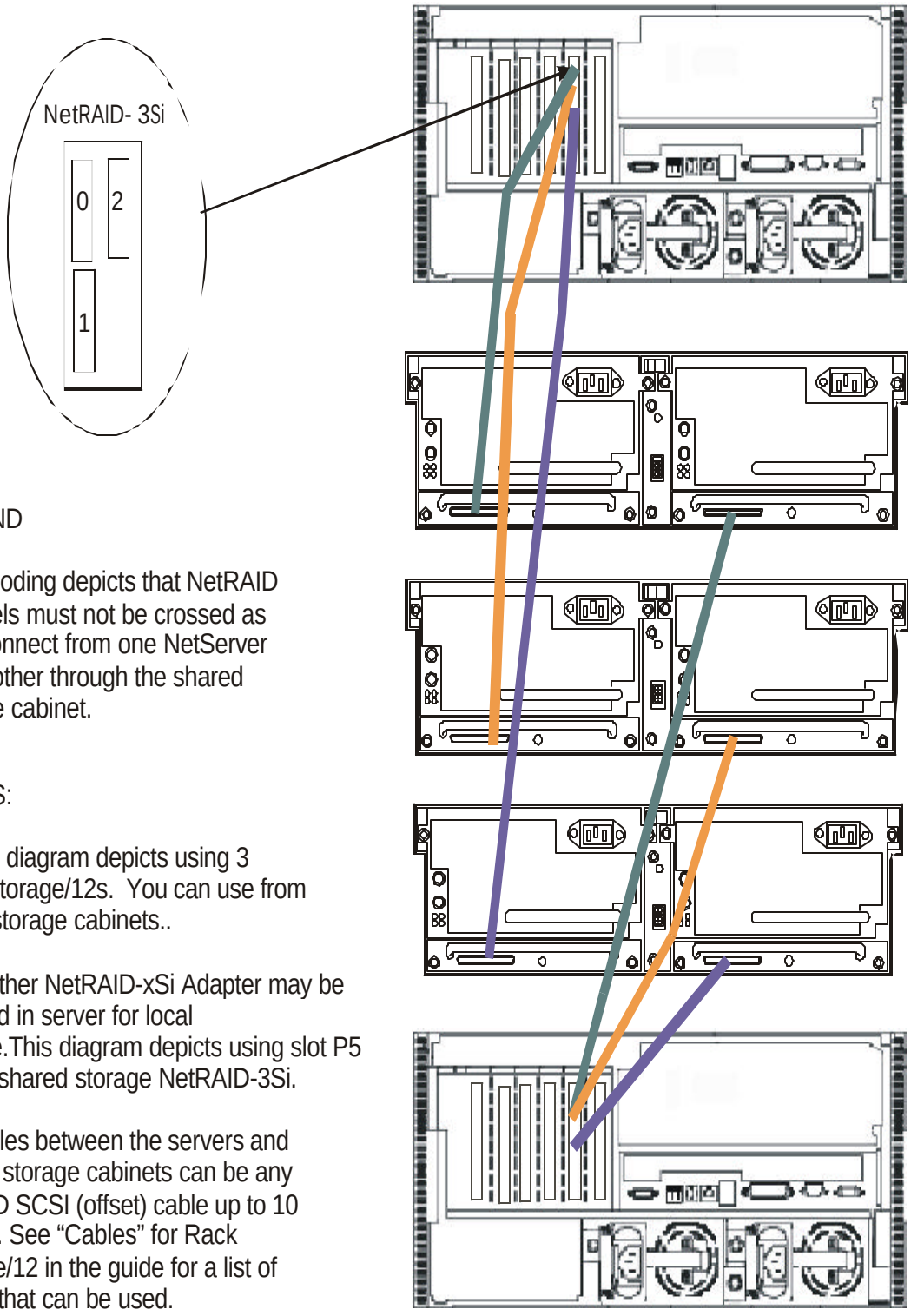
LANs

	Intra-cluster (Heartbeat) LAN	Client LAN
LAN connection	HP D5954A crossover cable or any equivalent. The intra-cluster LAN may only be used for cluster node communication via a crossover cable. It may not be used for client communication.	Any LAN

NIC:		
Model	Embedded NIC	Any that is on both the HP Tested Products List and the Microsoft Hardware Compatibility List.
Driver	Hptxnt.sys 3.27.00.0001 or later	The vendor supported driver. **NOTE** If the NIC used is the same type as the embedded NIC (D5013A/B), then the Client LAN NIC must use the same driver as the Intra-cluster NIC.
No. of NICs	1	1 minimum

Shared Storage Cabling

This part of the guide defines the allowable cabling configurations for clusters using the HP NetServer LC2000 and HP Rack Storage/12. Only these cabling configurations and cables are supported.



LEGEND

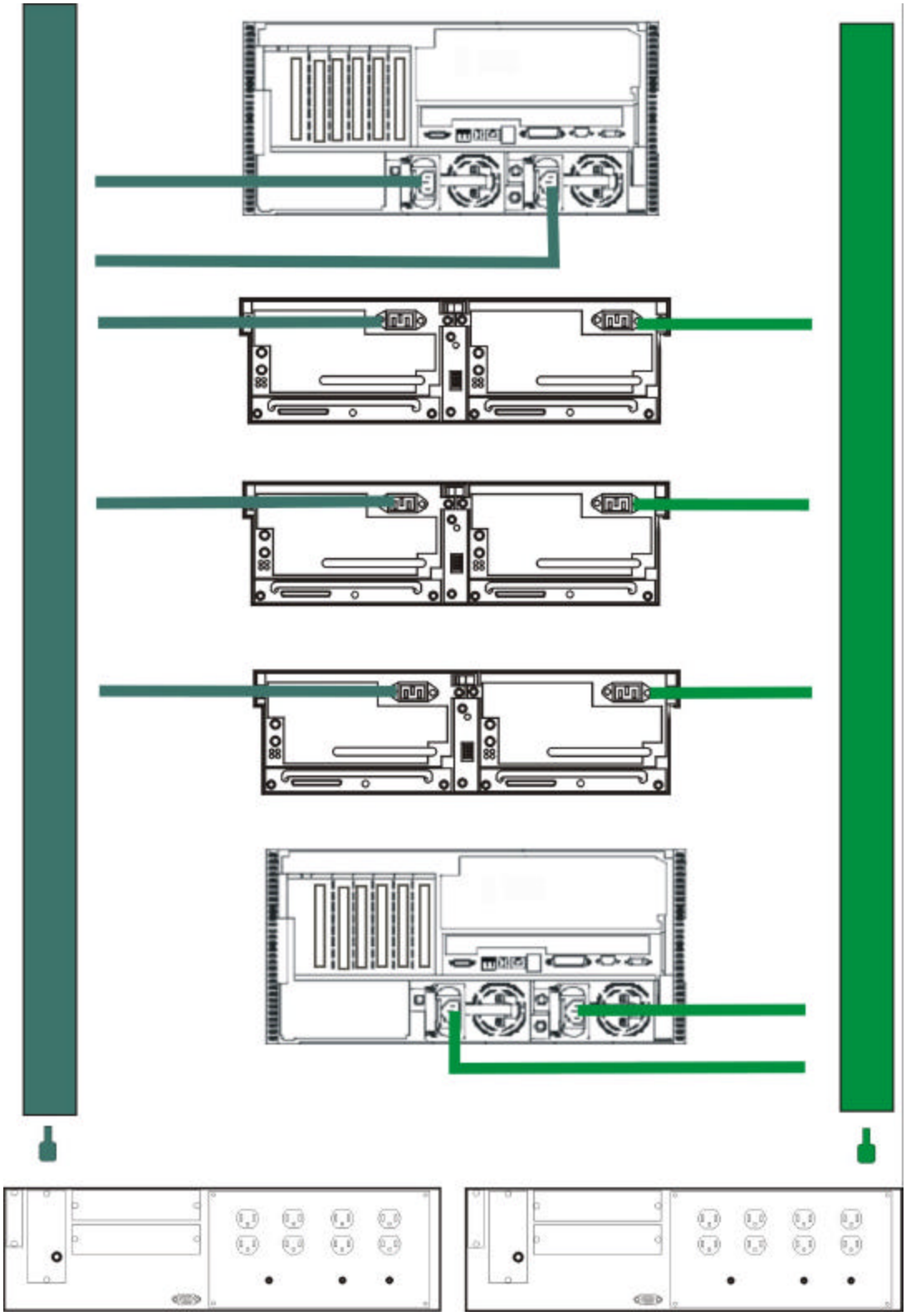
Color coding depicts that NetRAID channels must not be crossed as they connect from one NetServer to the other through the shared storage cabinet.

NOTES:

1. This diagram depicts using 3 Rack Storage/12s. You can use from 1 to 3 storage cabinets..

2. Another NetRAID-xSi Adapter may be installed in server for local storage.This diagram depicts using slot P5 for the shared storage NetRAID-3Si.

3. Cables between the servers and shared storage cabinets can be any HP LVD SCSI (offset) cable up to 10 meters. See “Cables” for Rack Storage/12 in the guide for a list of cables that can be used.



Power Cabling to Separate Power Sources

Versions

14 November 2000	Added 1000 MHz. Corrected mraid35x.sys to mraidnt.sys.
5 September 2000	Removed draft status
25 August 2000	Changed introduction, added 800, 933 MHz, new boot device definition boot order, driver info and Ultra3 HDDs. Rolled 3Si firmware/BIOS.
19 May 2000	Added BIOS disabled qualifier.
25 April 2000	Added NetRAID driver name, fixed typo and corrected drawing.
20 March 2000	Added support for NetRAID-1Si as a local storage controller.
17 February 2000	Initial release.